**29**. The probe of claim **28**, wherein the first functional group comprises an acceptor fluorophore and the second functional group comprises a donor fluorophore.

**30**. A method of detecting a target biomolecule, comprising:

contacting a sample with the probe of claim **1** under conditions sufficient for the functional groups to specifically interact with the target biomolecule, wherein interaction of the functional groups results in the production of a signal by a label on the probe;

detecting the signal when the probe interacts with target biomolecule.

**31**. The method of claim **30**, wherein the label comprises an acceptor fluorophore and wherein when interaction of the functional groups brings the acceptor fluorophore into a proximity with a donor fluorophore to permit excitation of the acceptor fluorophore by the donor fluorophore.

**32**. The method of claim **31**, wherein detecting a signal comprises detecting a fluorescent signal emitted from the acceptor fluorophore.

**33**. The method of claim **30**, wherein the sample comprises a cell, and wherein contacting the sample with the probe comprises contacting the cell with the probe under conditions sufficient for the probe to enter the cell.

**34**. The method of claim **33**, wherein the sample is obtained from a subject, and the method is performed ex vivo.

**35**. The method of claim **30**, wherein contacting the sample with the probe comprises administration of the composition to a subject.

**36**. The method of claim **30**, wherein the target biomolecule comprises a protein or a nucleic acid sequence.

**37**. The method of claim **36**, wherein the protein comprises one or more mutations associated with disease.

**38**. A method of modifying a target biomolecule, comprising:

exposing a sample to the composition of claim **21** under conditions sufficient for the nucleic acid sequence to bind to the target biomolecule, and sufficient for the protein to cleave the target biomolecule.

**39**. The method of claim **38**, further comprising detecting the cleaving of the target biomolecule.

**40**. A method of treating a subject, comprising:

administering a therapeutic amount of the composition of claim **23** or **25** to a subject, wherein the subject has a disorder that would benefit from the cleavage of the target biomolecule.

**41**. A method of sequencing a sample nucleic acid sequence, comprising:

contacting the sample nucleic acid sequence to an oligonucleotide primer and the probe of claim **27** in the presence of a mixture of non-labeled hydrolyzable nucleotides, wherein each non-hydrolyzable dNTP includes a label that emits a signal corresponding to the particular nucleotide complementary to a nucleotide on the sample nucleic acid sequence;

detecting the signal as each non-hydrolyzable dNTP is exposed to the sample nucleic acid molecule; and

allowing one of the non-labeled hydrolyzable nucleotides to be incorporated into a synthesized nucleic acid molecule complementary to the sample nucleic acid molecule.

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